

# Yancoal Southey Project



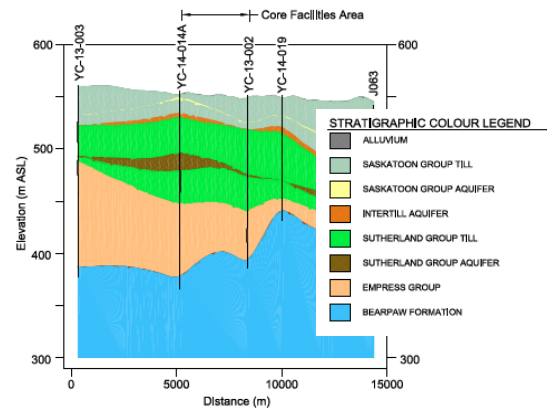
**What is an aquifer?** It is an underground area of water-bearing rock/sediment where groundwater could be extracted. **What is the Hatfield Valley aquifer?** It is a significant groundwater resource of the Empress Group.

**Where are freshwater aquifers located?** Saskatoon Group aquifer system is 5-30 metres (m) below the ground, Intertill aquifer 20-65 m, Sutherland Group aquifer 60-100 m, and the Empress Group 70-110 m.

**What is the baseline quality of the groundwater?** Groundwater from the Intertill and Empress groups has levels above existing drinking water and irrigation guidelines with elevated levels of sulphate, total dissolved solids, iron, and manganese.

**How will the Southey Project directly protect groundwater?** Brine will be disposed of by deep well injection (Deadwood and Winnipeg formations are at least 1 kilometre below freshwater aquifers), and will be transported in pipelines with secondary containment and leak detection. The waste material stored on surface will be placed on a lined surface and design features (buried cutoff wall and recovery wells) will isolate the site from freshwater aquifers.

## Groundwater



**How will the Southey Project confirm groundwater is protected?** Monitoring will be a regulatory requirement (groundwater, surface water, and subsidence). Changes will be detected and stopped before predicted effects are exceeded.

## Localized Effects to Groundwater Quality

As brine disposal and mining activities will occur at least 1 kilometre below the freshwater aquifers (i.e., no potential pathway for effects) and the waste stored on surface will be isolated from the environment beyond the site. Topsoil will be removed during site preparation limiting the ability of water to infiltrate and the site/ponds will be lined with compacted low permeability material (e.g., clay) and/or synthetic liners to provide containment. Freshwater will be diverted away from the site and potentially contaminated water onsite will be directed towards the brine ponds and/or runoff water collection pond for management. To prevent effects to groundwater next to the site, a cutoff wall and recovery wells will be installed. Modelling was used to show when these structures need to be in place (detail design will still be approved by regulators in next project phase). Seepage from waste storage area was modelled over 100s of years and groundwater (Saskatoon group and Intertill) quality (potassium and chloride) is not predicted to be affected beyond the site.

### Yancoal Canada Resources

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